Miscellanea.

FIREPROOF FLOORING AND ROOFING.—Mr. G. Nasmyth has obtained a patent for "certain improvements in the construction of fire-proof flooring and roofing, which improvements are also applicable to the construction of viaducts, aqueducts, and culverts." According to contemporaries, these improvements consist in constructing floors and roofs of iron plates, which are bent into the form of a segment of a circle, or into a conical, polygonal, or other shape, by the ordinary plate-bending machinery, or by any other suitable means. These bent plates are supported on chord plates, or tension bars, which have their ends bent upwards, whereby the plates are retained in their curved position when subjected to pressure. The ends of the chords rest upon the flanges of cast or wrought iron girders, above which are cast or riveted knee pieces, which prevent the bent ends of the chords from springing; or, instead of iron plates, angle or T iron, bent into the required shape, and supported upon chords resting upon the flanges of girders, may be employed. Over these curved ribs, iron plates are bent, with their ends placed underneath the bent-up ends of the chords. The spaces above the iron plates are filled up, to form the flooring, with Portland cement, mixed with broken bricks and other suitable materials. The improved girders are formed by bolting iron plates to the sides and top of stone arches and chords, combined as before. The side plates are made with flanges to support the arches and chords, which form the joists, and have also knee pieces bolted to them to prevent the chords from springing when the arch is subjected to pressure. The arches and chords may be made of one piece each, or may be made of several pieces bolted or riveted together. Currents of air may be caused to pass in the hollow spaces left between the arches and their chords, and through perforations in the floor in the room.—*Claims*—1. The modes of constructing floors and roofs of buildings, and the beams or girders of bridges, viaducts, and aqueducts by means of metal arches, or other curved or angular figures, or both, which are supported by chords that serve as abutments to the arches.—2. The application of this flooring to the warming, cooling, and ventilating of buildings, by causing currents of air to pass through the hollow spaces left between the arched plates and the chord plates. We have not yet seen the construction. It seems similar to an arrangement we saw some time since at Mr. Porter's works, Southwark.

NEW SAW-FILING AND SETTING MACHINE.—Messrs. Norton and Cottle, of Holmc's Hole, have recently patented a machine for filing and setting saws, enabling the operator to whet and set the teeth of saws in such a manner that every tooth will be equal in size and length, the proportion being graduated by an index, and so adjusted as to suit the teeth of saws of every description. Saws that have been used and become useless in consequence of bad filing, can be recut. The set is attached to the machine in such a manner, that when the filing is completed, no alteration is required in the adjustment of the saw to complete the setting. The inventors have found by experience, that the hardest saws can be set without breaking or injuring the teeth. Saws considered in a measure useless having passed through this machine are said to work perfectly easy, and perform much faster than those filed in the usual manner; and the teeth being all of an equal length, will not require filing as frequently. These machines, if not too expensive, we think, will come into extensive use.—*New York Mechanic.*

SMALL-POX HOSPITAL DESIGN.—Sir: I was surprised to see, in THE BUILDER of last Saturday, my design for the Small-pox Hospital (for which I received the 2nd premium) without my name attached to it. It should be by Moore and Matthews, and not Mathews only.—I am, Sir, yours, &c.—R. H. MOORE.

*** It was so published on the positive assertion of Mr. Matthews that the design was by himself alone. It is certain the premium was awarded to the two conjointly. We cannot enter into any discussion on the matter, and will only express the pain with which we ever view a want of good faith.

PROJECTED WORKS.—Advertisements have been issued for tenders, by 5th April, for paving the carriageway and footway of a new street about to be formed from Bermondsey-street to Griffith's-rents; by a date not specified, for the delivery in Oxford of not less than 500 tons of granite, &c., annually; by 16th, for the erection of the east wing of the Royal Berkshire Hospital; by 2nd, for putting down 2,500 feet of 18-inch glazed stone-ware pipe sewer along Hutchinson's-lane, Earl's-court-lane, and Pembroke-road, Kensington; by 10th, for the rebuilding and restoration of Kingstone Church tower, &c. (Herefordshire); by 11th, for the whole works required to complete the Portsmouth station of the Brighton and South-Western Railway; by 30th, for the execution of a new bridge over the Trent, near Newark; by 17th, for laying iron pipes through Folkstone and from reservoir, and also for formation of reservoir, and of new road, and other works (separate tenders) for the Folkstone Water-works; by 2nd, for a workhouse kitchen-range, with iron boiler, &c. at New Forest Union; by 17th, for the construction of three reservoirs, with embankments and stone work, &c., for Manchester Corporation Water-works; by 3rd, for the works in erecting a chapel, schools, &c., at Everton (Liverpool); and by 12th, for the erection of a stone or an iron suspension-bridge at Disserth, Radnor.

PATENTEES IN AMERICA.—The last annual report of the Commissioner of Patents in the United States contains the following passage:—"In my last annual report I had the honour to refer the attention of Congress to the expediency of placing the citizens and subjects of foreign governments, applying for patents in this country, on the same ground with regard to fees which our own citizens occupy. Deeming the matter of much importance to the interests of this country, I feel it to be my duty again to bring that subject to the consideration of that honourable body. At present, the subject of a foreign government who applies to this office for a patent is required to pay the sum of 500 dollars, if a subject of Great Britain, and 300 dollars if the subject or citizen of any other foreign power, before his application can be received, while the American citizen is required to pay only 30 dollars. It is true that the fees and duties required in most foreign countries are very much higher than those which our laws demanded, but they are imposed on all alike, whether subjects or foreigners. But even if it were just to make a discrimination in favour of American citizens with regard to fees for patents, I am of the opinion that the policy is injurious to the interests of this country, and therefore not expedient." We understand the recommendation is likely to be acted on.

DISCOVERIES AT FOUNTAINS ABBEY.—In a thicket of underwood, near the lady chapel, and where the river Skell is arched over, some interesting remains of the abbot's house have been discovered. In repairing the arches, and on reaching a level just above the perfect parts of the structure, the workmen came to pavements of encaustic tiles, the bases of two rows of clustered Early English columns, and broken Netherdale marble shafts, similar to those now to be seen in the choir and lady chapel. Here, too, in what appears to have been the common ash-hole, were found some Ralley or Ralage coal, and a silver tea-spoon! The remains seem to be spread over an extent not much less than the nave and choir of the Abbey Church, and, from what has already been uncovered, it appears that the whole ichnography of this important building may yet be retrieved by a careful excavation.

INSURANCE OF CHURCHES.—It has been urged, that while almost every house of any respectability in the country, and nine-tenths of the corn ricks and homesteads are insured, scarcely any of the churches have had the same precaution used with regard to them. It is said that a legal opinion of a high ecclesiastical authority was given in respect of Portsmouth Church, not many years past, to the effect that "the churchwardens would be censurable, I had almost gone the length of saying punishable, for omitting the necessary precaution of insuring the parish church from fire." Churches erected under the Church Commissioners are all insured, and generally to the amount of two-thirds of their cost.

INSTITUTION OF CIVIL ENGINEERS.—On the 27th, the paper read was a "Description of the Groynes formed on the South Rocks, the site of the new docks at Sunderland," by Mr. W. Brown. These groynes have been erected for the purpose of retaining the deposited materials excavated from the new docks, and of arresting the sand and shingle which naturally travel southward, in order to form a barrier beach, that should effectually exclude the sea from beyond a given line. The three first, whose lengths varied from 326 feet to 358 feet, were erected at a height above ordinary high-water mark of 2 feet 6 inches, and 10 feet at the seaward and inner ends respectively. The exterior was composed of ashlar-work; the interior partly of the excavated magnesian limestone, and partly of rubble set in mortar: the batter of the north sides was two and a half inches to a foot, that of the south sides one to one, and the crest was formed into an arch, with a radius of 5 feet 6 inches. The four other groynes were constructed of a different form, in consequence of those first erected not retaining the deposited excavation, and accumulating other materials as was desirable, and from their having been injured by the sea during a heavy storm, which occurred at the time of the equinoctial tides, during the spring of 1848, when a breach was made in the first and third groynes, and at the same time some of the stones in the second groyne were loosened. These effects were produced at about the same point in each, namely, the intersection of the inclination of the groyne with the line of ordinary high-water mark; and it was found, from observation, that the momentum of the waves was greatest at or about the time of high water. The sides of these groynes were semi-cycloidal, each being generated by a circle of 12 feet 9 inches in diameter, and uniting at the apex: the seaward and inner ends are respectively 7 feet and 10 feet above ordinary high-water mark, and their lengths varied from 510 feet to 579 feet. The foundations of these groynes consisted of a course of freestone, laid at an average depth of 2 feet below the surface: the sides were also of coursed freestone, set header and stretcher alternately, and the hearting of large-sized rubble, closely packed, the vacancies between it and the ashlar-work being filled with small stones set in Roman cement, so as to insure a solid bed. At a depth of 6 feet below the crest of the groyne, and resting upon the rubble hearting, coursed ashlar was introduced, and carried as near to the crest as possible, the vacancy being filled with small rubble and Roman cement.

A STEAM STONE-DRILL.—Mr. Joseph J. Couch, of Boston, has invented a steam-drill, which, it is said, can be worked so as to apply the force at any angle with the requisite rotary motion, and to do the work of seventy-five to eighty hands at once by the aid of two. The "*Atlas*," in describing it, says—"The drill is attached to a shaft by means of a socket. The shaft is made to ply with great force by simple mechanism, and as the drill approaches the rock is detached as by throwing by hand, only more forcibly. At every blow a rotary motion is effected by means of a small ratchet on the drill shaft. In horizontal positions the power depends on the momentum of the drill shaft; in vertical and inclined positions the momentum is assisted by gravity. At the trial, the machine was placed in a *horizontal* position, and perforated a block of the hardest granite with a 4-inch drill at an average rate of 22 inches in the hour; with a 3-inch drill, it executed from 25 to 30 inches in the hour. A medium rate is 125 blows per minute. But by heightening the speed, not only is the number, but the force of the blows increased. The machine can be seen at Mr. J. W. Fowle's, No. 16, East Orange-street." A machine of a like nature, we may here observe, but worked by hand or by horse, with a crank and fly-wheel, has been invented, or improved rather, by Mr. E. Nicholson, of Newcastle. It appears, however, to be only capable of drilling vertically. The drill is made to rotate also, and to be detached in falling and griped in lifting. With large drills, four men, or a horse, will thus cut a 4-inch hole in hard stone, it is said, at the rate of 2½ to 3½ feet an hour, and two men, with smaller machines, a 4-inch hole in freestone, at the rate of 5 to 6 feet an hour.